



286757

## ILLINOIS STATE WATER SURVEY

Collection of Water Samples

Sample should be taken from a point as close to the well pump as possible and after the pump has been in operation for a sufficient length of time to remove the stagnant water.

Data needed for each sample:

City MONSANTO County ST. CLAIR

Name of owner MONSANTO Chemical Co.

Exact identification of well #8 (Pomona Station)

Exact location of well \_\_\_\_\_

Sample collected on (date) 4-16-43 at (time) 10:30 AM

after 24 hours pumping at 570 gal. per min.

Tap used for sample\*: (at well) storage tank, distribution system

Depth of well 105 feet. Diameter 16 inches,

Cased to 75 feet. Screen from 75 feet to 105 feet

Where possible report also:

Log of well \_\_\_\_\_

Date drilled 10-39 Well driller H.L. WATSON

Major repairs \_\_\_\_\_

Type of pump POMONA 4 STAGE CENT.

Hours or days in use per week 7 days

Non-pumping level 37 feet. Pumping level 70 feet

expressed as: \* Mean Sea level. (Feet below top) Gage reading.

Sea level elevation of top of well TOP OF BASE FL. ELEV. 99.27.

Temperature of water 60° Sample collected by J. G. McElligott

For office use: Analysis No. 95988

\*circle the correct designation.

June 29, 1943

SHORT PARTIAL ANALYSIS

Sample of water collected April 16, 1943 from well owned by Monsanto Chemical Co., Monsanto, Illinois. Well No. 9. Depth of well: 105'. Rate of pumping: 950 gpm. after 24 hours. P. 2 W.; H. 10 W.

LABORATORY NO. 95989

Determinations Made

	Parts per Million
Turbidity	100
Color	0
Odor	0
Iron	0
(unfiltered)	14.8
Chloride	18.0
Alkalinity (as $\text{CaCO}_3$ )	0.0
Phenolphthalein	0.0
Methyl Orange	332.0
Total Hardness (as $\text{CaCO}_3$ )	480.
Total Mineral Content	554.1
Temperature 60° F.	

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

TEL:AB

June 29, 1943

SHORT PARTIAL ANALYSIS

X  
STC 2 N10W-26.33

Sample of water collected April 16, 1943 from well owned by Monsanto Chemical Co., Monsanto, Illinois, Well No. 10. Depth of well: 110 ft. Rate of pumping: 700 gpm. after 24 hours.

NE 1/4 Sec. 26, T. 2 N., E. 10 W.

LABORATORY NO. 95990

Determinations Made

	Parts per Million
Turbidity	100
Color	0
Odor	Tr.
Iron (unfiltered)	43.2
Chloride	33.0
Alkalinity (as $\text{CaCO}_3$ )	0.0
Phenolphthalein	116.0
Methyl Orange	480
Total Hardness (as $\text{CaCO}_3$ )	636
Total Mineral Content	
Temperature 60° F.	

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

FEL:AB

June 29, 1943

STC 2N10W-26.2e

SHORT PARTIAL ANALYSIS

Sample of water collected April 16, 1943 from well owned by Monsanto Chemical Co., Monsanto. Well No. 12. Depth of well: 110'. Rate of pumping: 400 gpm. after 24 hours.

NE 1/4 Sec. 28, T. 2 N., R. 10 W.

LABORATORY NO. 95991

Determinations Made

	Parts per Million
Turbidity	100
Color	0
Odor	0
Iron (unfiltered)	17.6
Chloride	35.0
Alkalinity (as $\text{CaCO}_3$ )	0.0
Phenolphthalein	0.0
Methyl Orange	112.0
Total Hardness (as $\text{CaCO}_3$ )	508
Total Mineral Content	911
Temperature	60° F.

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

TEL:AB

June 29, 1943

SHORT PARTIAL ANALYSIS

STC 2N10W-26.28

Sample of water collected April 16, 1943 from well owned  
by Monsanto Chemical Co., Monsanto, Illinois. Well No. 13.  
Depth of well: 195'. Rate of pumping: 660 gpm. after 24 hours.  
HE 1/4, Sec. 26, T. 2 N., R. 10 W.

LABORATORY NO. 95992

Determinations Made

	Parts per Million
Turbidity	100
Color	0
Odor	Sweetish
Iron	Fe
(unfiltered)	13.6
Chloride	Cl
	27.0
Alkalinity (as $\text{CaCO}_3$ )	
Phenolphthalein	0.0
Methyl Orange	326.0
Total Hardness (as $\text{CaCO}_3$ )	530
Total Mineral Content	326
Temperature	60° F.

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

TEL:AB

June 29, 1943

SHORT PARTIAL ANALYSIS

STC 2N10W-26:39

Sample of water collected April 16, 1943 from well owned  
by Monsanto Chemical Co., Monsanto, Illinois. Well No. 11.  
Depth of well: 105'. Rate of pumping: 540 gpm. after 24 hours.  
NE 1/4, Sec. 26, T. 2 N., R. 10 W.

LABORATORY NO. 95293

26:39

Determinations made

	Units per Million
Turbidity	100
Color	0
Odor	Diagnosable
Iron	ppm
(unfiltered)	47.2
Chloride	Cl 56.0
Alkalinity (as $\text{CaCO}_3$ )	
Phenolphthalein	0.0
Methyl Orange	270.0
Total Hardness (as $\text{CaCO}_3$ )	726.
Total Mineral Content	1056.
Temperature	60° F.

STATE WATER SURVEY DIVISION

T. S. Larson, Chemist

TEL:45

June 29, 1943

SHORT PARTIAL ANALYSIS

Sample of water collected April 16, 1943 from well owned by Monsanto Chemical Co., Monsanto, Illinois. Well No. 15. Depth of well: 108 1/2 feet. Rate of pumping: 325 gph. after 24 hours. NE 1/4 Sec. 26, T. 2 N., R. 10 W.

LABORATORY NO. 35994

Determinations Made

	Parts per Million
Turbidity	100
Color	0
Chlor	Measurable
Iron	Fe
(unfiltered)	21.3
Chloride	Cl
	21.0
Alkalinity (as CaCO <sub>3</sub> )	
Phenolphthalein	0.0
Methyl Orange	22.0
Total Hardness (as CaCO <sub>3</sub> )	776.3
Total Mineral Content	1108.
Temperature 60° F.	

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

TFL:AB

June 29, 1943

SHORT PARTIAL ANALYSIS

STC 2N10W-26.49

Sample of water collected April 16, 1943 from well owned by Monsanto Chemical Co., Monsanto, Illinois. Well No. 7. Depth of well: 104 feet. Rate of pumping: 575 gpm. after 24 hours. NE 1/4 Sec. 26, T. 2 N., R. 10 W.

LABORATORY NO. 98603

Determinations Made

		Parts per Million
Turbidity		100
Color		20
Odor		Medicinal
Iron	Fe	
(unfiltered)		37.2
Chloride	Cl	148.0
Alkalinity	(as $\text{CaCO}_3$ )	
Phenolphthalein		0.0
Methyl Orange		360.0
Total Hardness	(as $\text{CaCO}_3$ )	770.0
Residue		1856.
Temperature	60° F.	

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

TEL:AB

June 29, 1943

SHORT PARTIAL ANALYSIS

STC 2N10W-26.39

Sample of water collected June 8, 1943 from well owned by Monsanto Chemical Co., Monsanto, Illinois. Well No. 8. Depth of well: 103 ft. Rate of pumping: 580 gpm. after 24 hours.

NE 1/4 Sec. 28, T. 2 N., R. 10 W.

LABORATORY NO. 90161

Determinations Made

	Parts Per Million
Turbidity	100 (+)
Color	0
Odor	0
Iron (unfiltered)	6.9
Chloride	32.0
Alkalinity (as $\text{CaCO}_3$ )	0.0
Phenolphthalein	0.0
Methyl Orange	465.0
Total Hardness (as $\text{CaCO}_3$ )	807.8
Total Mineral Content	1465.0
Temperature	62° F.

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

TEL:AB

August 4, 1943

SHORT PARTIAL ANALYSIS

Sample of water collected April 1, 1943 from well  
owned by Moss Tie Co. Monsanto, Well No. 1, Genserville,  
Illinois. Depth of well: 100'. Rate of pumping:  
75 gpm. after 2 hours.  
SW 1/4, Sec. 26, T. 2 N., R. 10 W.

LABORATORY NO. 95770

Determinations Made

	Pts. per Million
Turbidity	Tr.
Color	0
Odor	0
Iron	Fe
(unfiltered)	1.7
Chloride	Cl
Alkalinity (as $\text{CaCO}_3$ )	32.6
Phenolphthalein	0
Methyl Orange	396
Total Hardness (as $\text{CaCO}_3$ )	322
Total Mineral Content	469
Temperature	54° F.

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

TEL:AB

St. Clair

December 29, 1947

CHEMICAL ANALYSIS

Sample of water collected December 12, 1947 from well owned by the Monsanto Chemical Co., Monsanto, Illinois. Location of well: 2160' E. & 340' W. of NE. corner, Section 26, T. 2 N., R. 10 W. Depth: 105'. Well No. 11.

LABORATORY NO. 112,885

		<u>ppm.</u>	<u>epm.</u>			<u>ppm.</u>	<u>epm.</u>
Iron (total)	Fe	12.8		Silica	SiO <sub>2</sub>	37.0	
Manganese	Mn	0.3		Fluoride	F	0.3	
Calcium	Ca	130.2	6.51	Chloride	Cl	18.0	0.51
Magnesium	Mg	40.6	3.34	Nitrate	NO <sub>3</sub>	0.1	Tr.
Ammonium	NH <sub>4</sub>	0.5	0.03	Sulfate	SO <sub>4</sub>	137.0	2.85
Sodium	Na	15.6	0.68	Alkalinity (as CaCO <sub>3</sub> )		360.	7.20
Turbidity		100 <sup>±</sup>		Hardness (as CaCO <sub>3</sub> )		493.	9.85
Color		0		Residue		603.	
Odor		Chemical					

ppm. = parts per million  
epm. = equivalents per million  
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Irene Van Meter, Asst. Chemist

IV:AB

STC 2N10W-26.1e

26.1e

December 29, 1947

STC 2N10W-26.2e1  
26.2e

PARTIAL CHEMICAL ANALYSIS

Sample of water collected December 12, 1947 from Well No. 12 owned by the Monsanto Chemical Co., Monsanto, Illinois. Location of well: 2540' S. & 1090' W. of NE. corner, Section 26, T. 2 N., R. 10 W. Depth: 105'.

LABORATORY NO. 112,886

	<u>ppm.</u>	<u>epm.</u>		<u>ppm.</u>	<u>epm.</u>
Iron (total) Fe	16.8		Chloride Cl	52.0	1.47
			Sulfate SO <sub>4</sub>	145.4	3.03
Turbidity	100-		Alkalinity (as CaCO <sub>3</sub> )	416.	8.32
Color	0		Hardness (as CaCO <sub>3</sub> )	514.	10.28
Odor	Chemical		Total Mineral Content	680.	

ppm. = parts per million  
epm. = equivalents per million  
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Irene Van Meter, Asst. Chemist

IV:AB

December 29, 1947

STC 2N10W-26.4e  
26.4e

CHEMICAL ANALYSIS

Sample of water collected December 12, 1947 from Well No. 16 owned by the Monsanto Chemical Co., Monsanto, Illinois. Location of well: 2240' S. & 2200' W. of NE. corner, Section 26, T. 2 N., R. 10 W. Depth: 109'.

LABORATORY NO. 112,888

		ppm.	epm.			ppm.	epm.
Iron (total)	Fe	15.2		Silica	SiO <sub>2</sub>	45.2	
Manganese	Mn	0.5		Fluoride	F	0.4	
Calcium	Ca	141.7	7.09	Chloride	Cl	34.0	0.96
Magnesium	Mg	37.2	3.06	Nitrate	NO <sub>3</sub>	Tr.	Tr.
Ammonium	NH <sub>4</sub>	0.6	0.03	Sulfate	SO <sub>4</sub>	163.7	3.41
Sodium	Na	30.1	1.31	Alkalinity (as CaCO <sub>3</sub> )		356.	7.12
Turbidity		100 <sup>+</sup>		Hardness (as CaCO <sub>3</sub> )		508.	10.15
Color		35		Residue		662.	
Odor		Chemical					
Temperature	58° F.						

ppm. = parts per million  
epm. = equivalents per million  
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Irene Van Meter, Asst. Chemist

IV:AB

*Wef*  
Adlai E. Stevenson

STATE OF ILLINOIS  
~~DWIGHT H. GREEN~~, GOVERNOR

STATE WATER SURVEY DIVISION

ARTHUR M. BUSWELL, CHIEF

URBANA, ILL.

\* Noble J. Puffer

August 26, 1949

MONSANTO CHEMICAL CO.

East St. Louis, Illinois

Subject: Conference on industrial use of water

Date: August 18, 1949

Personnel: Mr. J. F. Stickley - M.C.C. Assistant Plant Manager  
Mr. J. P. Bufe - M.C.C. Utility Engineer for power  
plant and water supply  
Mr. H. E. Hudson - S.W.S. Civil Engineer  
Mr. T. E. Larson - S.W.S. Chemist  
Mr. R. P. Strout - S.W.S. Mechanical Engineer

Products: Chlorine and caustic soda (NaOH)  
Sulfuric acid (Numerous other minor products)

Chlorine is produced by a gas by passing an electric current through a solution of common salt in a Nelson Cell. The resulting caustic soda remains in solution.

Sulfuric acid is produced by the contact or catalytic process in which burning sulfur forms  $SO_3$  in the presence of vanadium catalyst combining with 98% sulfuric acid  $H_2SO_4$ , to form 99% sulfuric acid.

The municipal water company supplies approximately 2,000,000 gpd of soft water (130 ppm) to the plant.

Municipal water is drawn from the Mississippi River.

City water is used for fire supply as insurance Co. considers it most reliable.

City water used in plant for sanitary purposes, as solvent in process water (dissolves salts), as make-up in evaporative cooling units.

The plant draws about 10 Mgd. of water from its own wells.

The water level is reported not to have changed materially over a period of 40 years.

Well water is highly mineralized (13000 ppm) containing much iron (15-20 ppm.) which tends to clog heat exchangers particularly if exposed to air.

Water from 2 wells is treated with sulfur dioxide to delay precipitation of iron sludge.

Concentration of  $\text{SO}_2$  is maintained at 7 ppm.

Well water is used only for heat transfer cooling. In the cooling process the water is limited to a 25° F. temperature rise as a greater temperature increase would result in precipitation of the iron and  $\text{CaCO}_3$  sludge, within equipment.

Both municipal and well supply are metered but plant desires a greater number of meters at points of use.

The temperature range of chemical processes is from -10° C. to 250° C.

The water system represents 2 to 4 percent of the total plant investment.

It is estimated that well water costs between 4 and 5 cents per 1000 gallons.

Major water equipment used for cooling consisted of:

- Cell forced draft cooling towers for
- 1 spray pond for caustic separation
- 1 cascade evaporative condenser for  $\text{SO}_3$  cooling.

R. P. Strout

Monsanto Chem. Co.

Well No. 3

Drilled by H. L. Watson (Waly)

July 1941

Formations passed through	Thickness	Depth of bottom
Fill	10	
Mud	8	18
Yellow sand	10	28
Gray sand (getting coarser)	35	63
#30 sand	15	78
#40 gravel	5	83
#50 "	5	88
#60 "	17	105 TD

Static level from surf 30'

Screen Johnson

Slot 40

Diam. 16

Length 30'

Monsanto ChemCo. (Plant "B")

Well No. 12

Drilled by H. L. Watson

Formations passed through	Thickness	Depth of bottom
No log	70	
Fine sand	5	75
Coarse sand and gravel	5	80
" " " "	5	85
" " " "	5	90
" " " "	5	95
" " " "	5	100
Sand and gravel	5	105
" " "	5	110
Few boulders	2	112

Static level from surf. 39'6"

Tested capacity 1250 gpm

Screen Johnson

Slot 60-80-100

Diam. 16

Length 27 1/2